

## **Chapter 4**

### **Design**

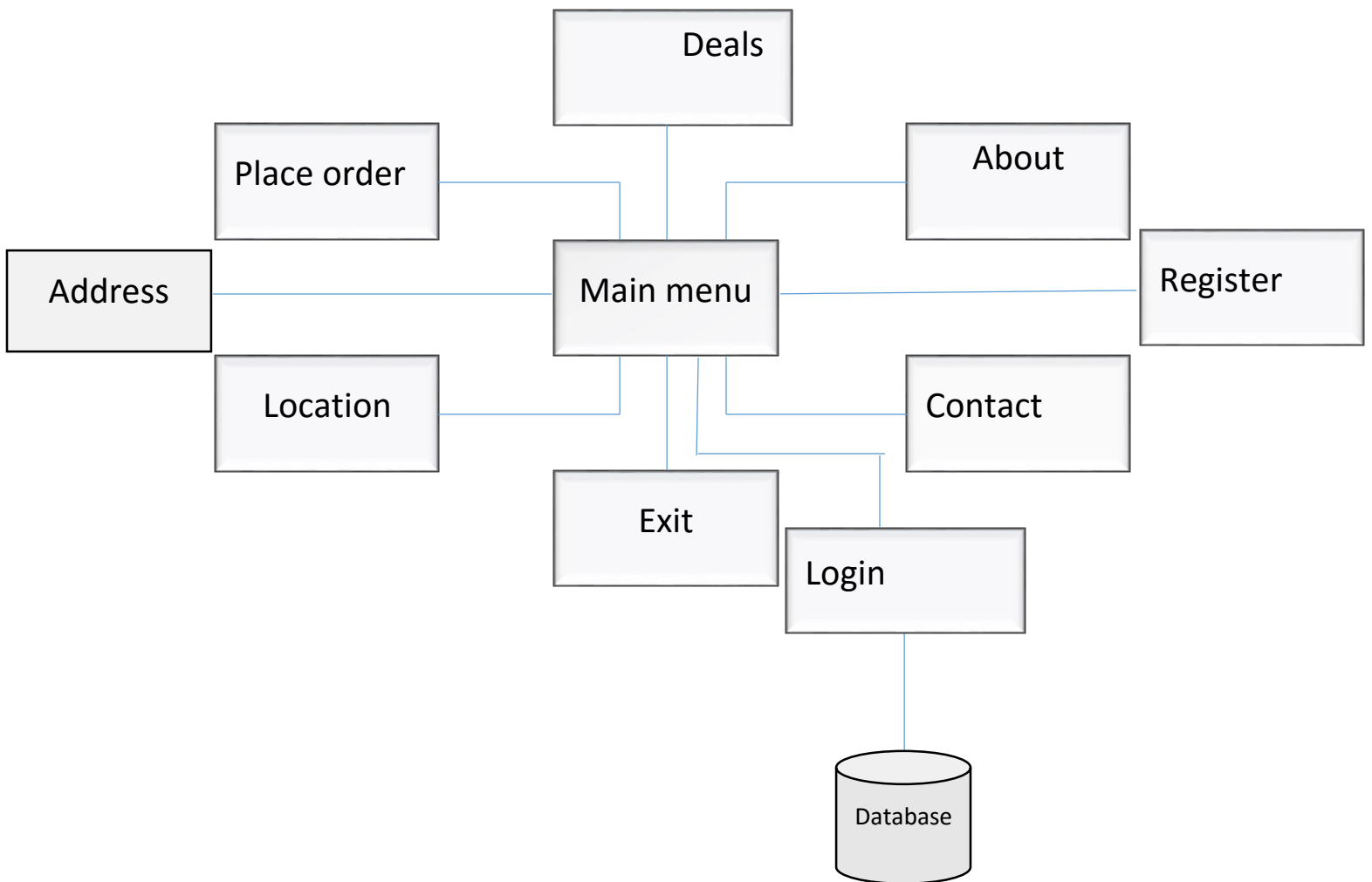
In website design we build the interface, and provide the layout as the interaction between the back-end of the website and the user. We use three main languages; Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), and JavaScript (JS). With these languages, a developer is able to create a full-fledged website. From the main design layout, to inserting images, applying different types of typography and font families, implementing animations, the flow of different pages, form interfaces, and more.

The development of a website is done at two level front end and back end. In the front end, the coding is done using languages like HTML, CSS, and JavaScript. Whereas at the back end the server data and requests are stored.

Building the actual interface through which a user interacts with the website. This interface is built by front-end developers using HTML, CSS, and JS languages.

#### **4.1 System Architecture:**

System architecture is the structural design of systems. Systems are a class of software that provides foundational services and automation. A basic approach to architecture is to separate work into components. These may be designed to be reusable. Components also serve to reduce extremely complex problems into small manageable problems (Clements, et al., 2010). The difference between a costly, unstable, low performance system and a fast, cheap and reliable system often comes down to how well it has been architected into components.



## **4.2 Design Constraints:**

When designing a website you have to consider the end user. Constraints can be defined as the practice of limiting the user's actions on a website. Limiting the user's actions on a website increase the usability of the interface is reducing the likelihood of them encountering an error. There are two types of Constraints. Physical Constraints decrease the responsiveness of control which prevents any undesired actions. Psychological Constraints will guide the user on a subconscious level making your website more intuitive.

### **4.2.1 Physical Constraints:**

These are physical objects, be that actual or virtual, that restrict the user's actions on the site. There are three different types of Physical Constraints; Paths, Axes and Barriers.

Paths constrain the user in a linear fashion. This is usually displayed with a visual groove or channel. The uses of Paths are best implemented when you want to allow users to vary the value of something in small increments. For example, volume controls on music player where there is no way to misuse the control.

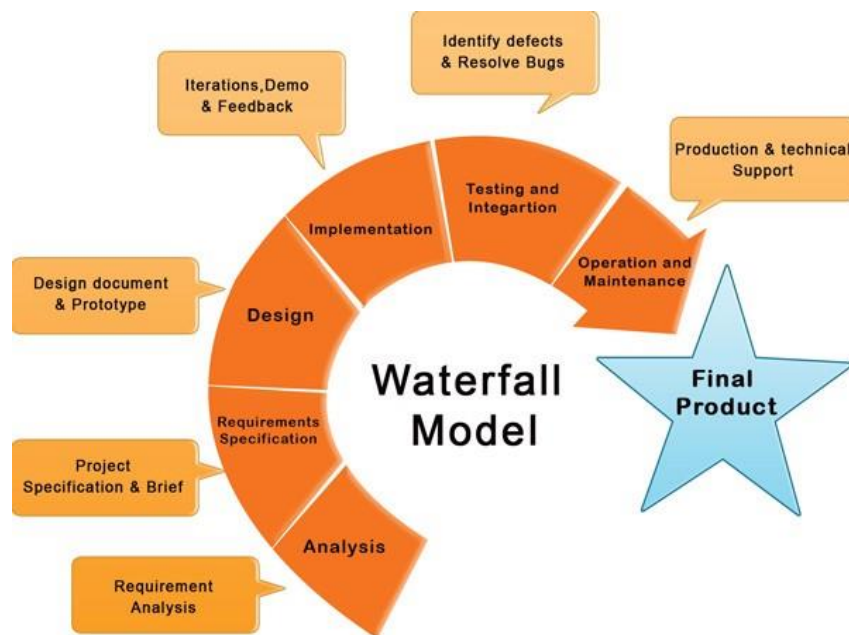
### **4.2.2 Psychological Constraints:**

These are constraints which control the way the user perceives their environment. There are three methods of implementing psychological constraints; symbols, conventions, and mapping. Symbols can be in the form of text, icons and/or sounds. Symbols are great way to sort, clarify and warn users about certain actions. An example of this in effect would be the sound a PC makes when an entry is invalid or incomplete. It warns the user that additional actions are necessary to complete a task. Another constraint of website design is that unlike print designs, where the viewing area of any design is fixed, web users can (and do) zoom in or out as they interact with a web page, changing the size of text and images. And, by the way, different browsing (Swiderski, 2013) environments handle zoom differently — some enlarge images as text is enlarged, and other times enlarging text doesn't affect other page elements.

## 4.3 Design methodology:

Design methodology refers to the development of a system or method for a unique situation. Today the term more often applied to technological fields in reference to, web design, software or information system design. Sign Methodology

A professional website requires careful analysis, proper planning, recent graphics and Website Designing technology combined with the company's needs. We use waterfall model in our website.



### 4.3.1 Need Assessment Phase:

A key part of our development process is to understand your business and capture the unique requirements of your project and coming needs.

### 4.3.2 Requirement Phase:

During this phase, we go over your requirements in detail and provide you with a document that physically describes what needs to be done, how implementation will occur, and identifies any problem areas.

### **4.3.3 Design Phase:**

When designing website, we take into account its purpose and audience. Working within your specifications, will make decisions about how web components will accomplish the site's objectives. Our goal is to achieve the effects called for in the most flexible, efficient and elegant way.

### **4.3.4 Development Phase:**

This involves the process of building your web site according to its design.

### **4.3.5 Implementation Phase:**

This phase involves the installation of the web site and any necessary training for users.

### **4.3.6 Support Phase:**

After implementation of the requirement provide continued support, based on the needs.

## **4.4 High Level Design:**

High-level design (HLD) explains the architecture that would be used for developing a software product. The architecture diagram provides an overview of an entire system, identifying the main components that would be developed for the product and their interfaces. The HLD uses possibly nontechnical to mildly technical terms that should be understandable to the administrators of the system. In contrast, low-level design further exposes the logical detailed design of each of these elements for programmers.

### **4.4.1 Logical Design:**

Architectural concepts are the designer's way of responding to the design situation presented to them. They are a means of translating the non-physical design problem into the physical building product. Every project will have critical issues, central themes or problem essences, and the general issues of designing a building can be approached in a number of ways.

### **4.4.2 Component Diagram:**

Component diagrams are used to visualize the organization and relationships among components in a system. These diagrams are also used to make executable systems. The purpose of the component diagram can be summarized as

- Visualize the components of a system.
- Construct executables by using forward and reverse engineering.
- Describe the organization and relationships of the components.

## **4.5 Low Level Design:**

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. This process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work. Post-build, each component is specified in detail. The LLD phase is the stage where the actual software components are designed. During the detailed phase the logical and functional design is done and the design of application structure is developed during the high-level design phase.

## **4.6 Database Design:**

The first step in designing a great database for your web application is requirements analysis - in other words, finding out what's needed (M.A. Kahn, 1977,), and working out the best way to deliver a system that fulfills that needs. Designing the database will then take place as part of an overall system design phase.

### **4.6.1 Entities:**

The first step is to define the entities. Break it down based on how you expect to store information. Anything that is a noun is likely to be an entity. Everything else will be attributes.

### **4.6.2 Relationships:**

Items can be related to each other in various ways:

One-to-one

One-to-many

Many-to-many

In a situation where an entity has a one-to-one relationship in both directions, chances are it can be combined into one database table. For instance, each site only has one site owner. Therefore, site owner information could be contained within the site table. Many-to-many relationships cannot be represented in a relational database and will need to be resolved into one-to-many relationships.

### **4.6.3 Defining attributes:**

Now that we have our entities and how they are related to each other, it's time to set the attributes of each entity. These attributes will be the field names in the database. Going back to our User entity, we can define attributes such as name, address and phone number.

### **4.6.4 Normalization:**

Normalization is the process of reducing the amount of duplicate types of information in a table. One aspect of data model design which always needs to be considered is whether (or specifically, to what extent) to 'normalize' data. Data normalization is essentially the removal or reduction of duplication.

## **4.7 GUI Design:**

An application's user interface design is more than the sum of its aesthetic decisions and branding. At its best, UI design is a tool for helping users achieve what they need in an efficient manner. It is a key part of the overall user experience — one that supports an application's workflow and seamlessly delivers information and functionality.

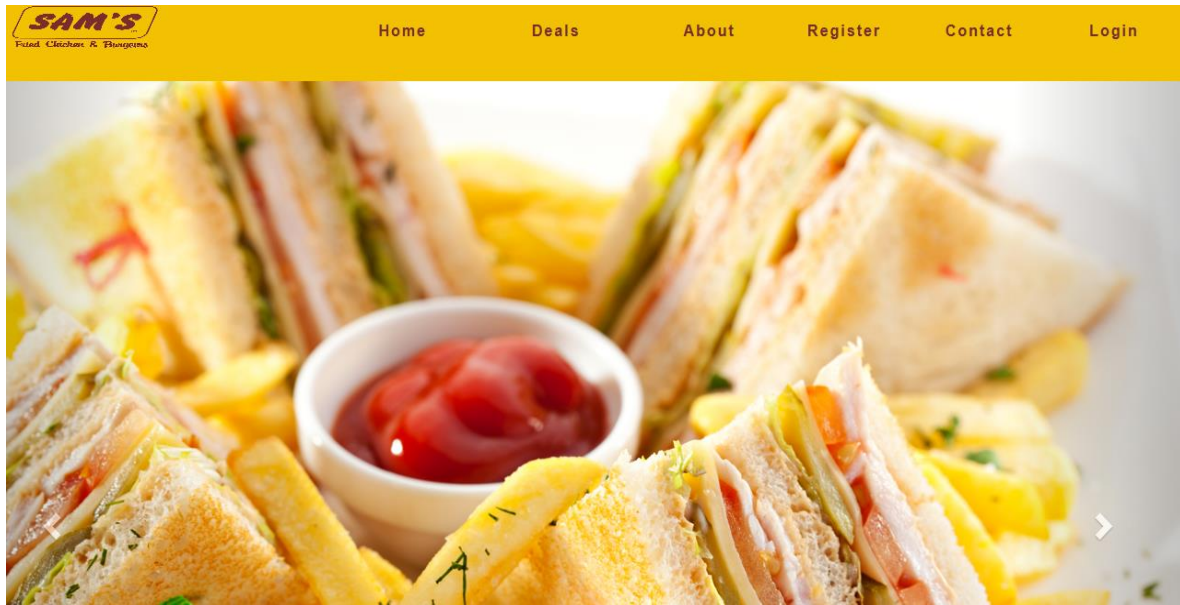


Fig 4.7.1: Main menu

# HOT DEALS

**Crunchy Deal** **Rs.370**

- 1 Crunchy Burger
- 1 Pc Drum Stick
- 1 Reg. Drink
- French Fries,

**Family Deal** **Rs.1299**

- 2 Crunchy Chicken Burger
- 2 Chicken Patty Burger
- 2 Ps Crispy Fried Chicken
- 1.5 Ltr Drink
- French Fries

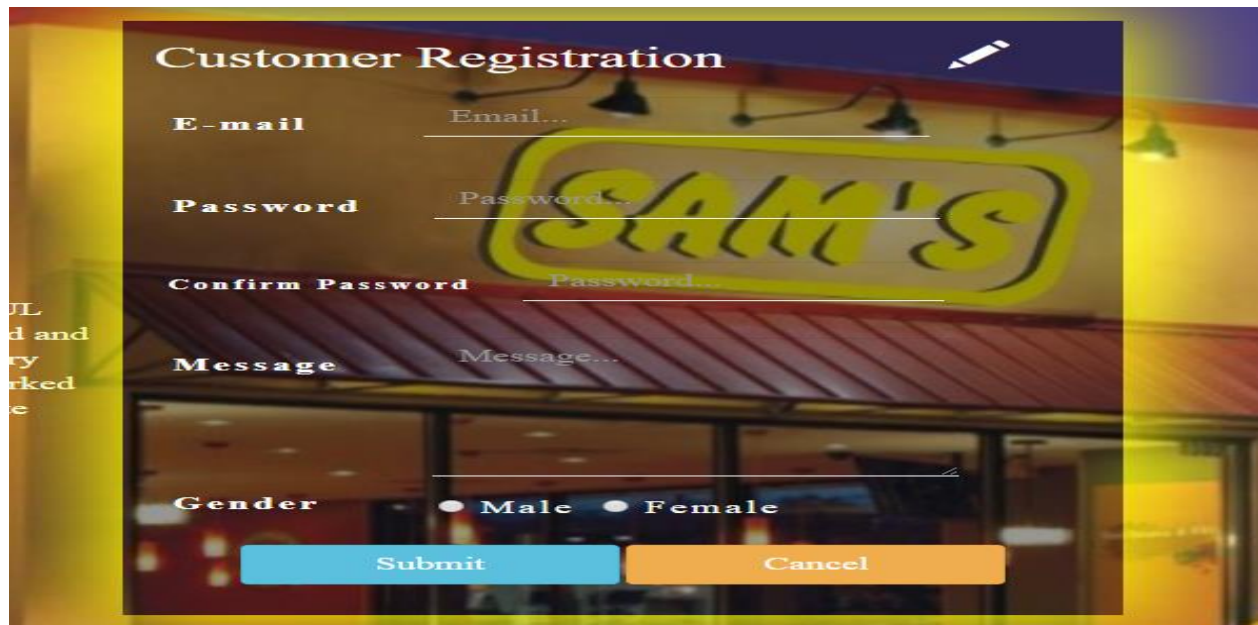
**Family Deal 2** **Rs.1599**

- 4 Crunchy Chicken Burger
- 2ps Crispy Fried Chicken
- 1.5 Ltr Drink
- French Fries

The visual representation shows the items included in each deal. The Crunchy Deal features a single burger, a drumstick, a cup of fries, and a Coca-Cola cup. The Family Deal shows two burgers, two chicken patties, two pieces of fried chicken, a 1.5L bottle of Coca-Cola, and a pile of fries. The Family Deal 2 shows four burgers, two pieces of fried chicken, a 1.5L bottle of Coca-Cola, and a pile of fries.

Fig4.7.2:Deals





**Customer Registration**

**E-mail**

**Password**

**Confirm Password**

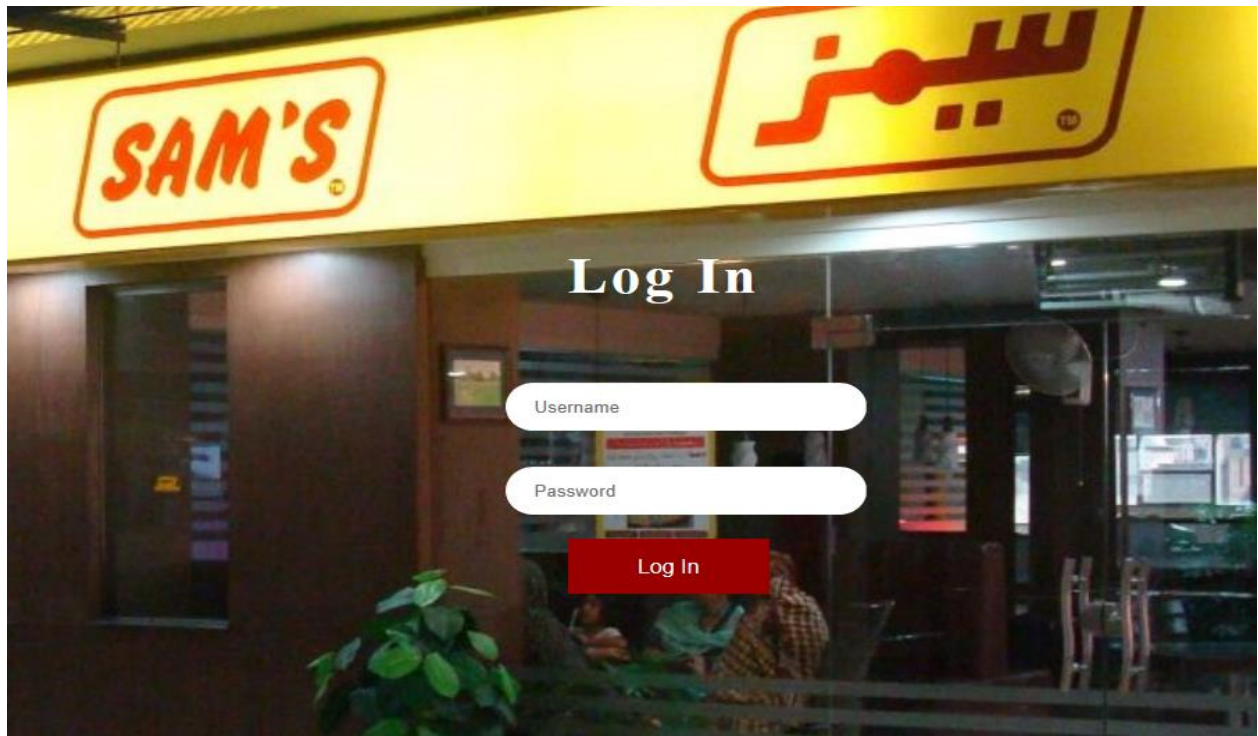
**Message**

**Gender** ☐ Male ☐ Female

Fig4.7.3:Register



Fig4.7.4:contact us



**Fig4.7.5:login page**

## Chapter - 5

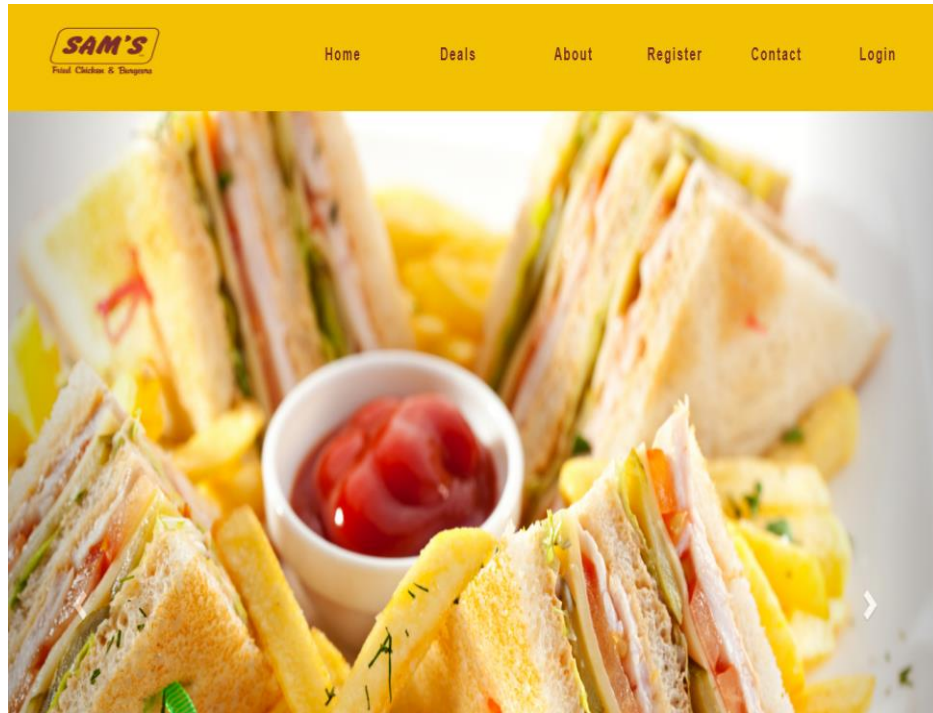
### System Implementation

SDLC is a process which defines the various stages involved in the development of software for delivering a high-quality product. SDLC stages cover the complete life cycle of software i.e. from inception to retirement of the product.



#### Homepage:

The homepage consists of main slider showcasing category of fast food available at SAM's food restaurant. It also consists of top navbar which is used to navigate to different pages of the website.



**Fig5.1.1**

## Deals Page:

This page consists of deals new offers. This page displays all the deals of SAM's food restaurant. This page also includes header and footer.

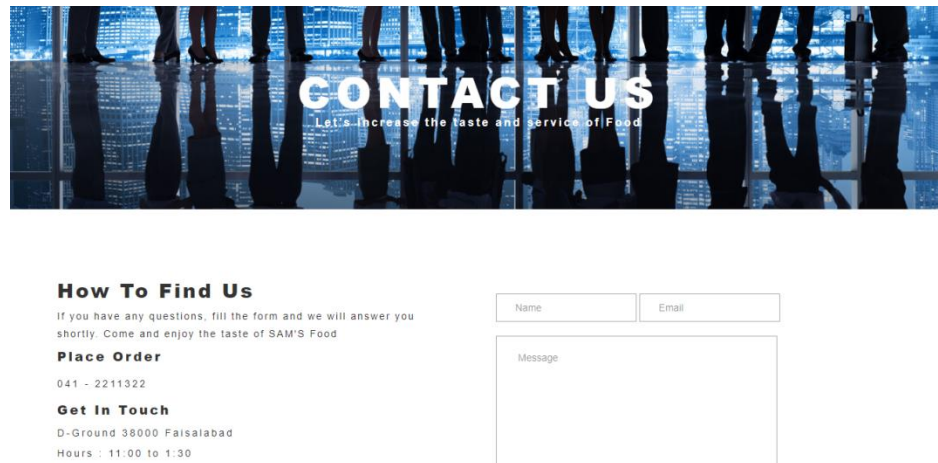


**Fig 5.1.2**



## Contact Us:

The contact us webpage shows the contact information and it also contains a feedback form used by the customer to submit feedback.



The image shows a webpage header with a blue background featuring silhouettes of people and the text "CONTACT US" in large white letters, with the tagline "Let's Increase the taste and service of Food" below it. The main content area is divided into two columns. The left column contains the heading "How To Find Us" followed by the text "If you have any questions, fill the form and we will answer you shortly. Come and enjoy the taste of SAM'S Food". Below this is the heading "Place Order" with the phone number "041 - 2211322", and the heading "Get In Touch" with the address "D-Ground 38000 Faisalabad" and hours "Hours : 11:00 to 1:30". The right column contains a contact form with fields for "Name", "Email", and "Message".

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Fig5.1.3

## Location Page:

This page displays the map location of the SAMS food restaurant. It also includes header and footer.

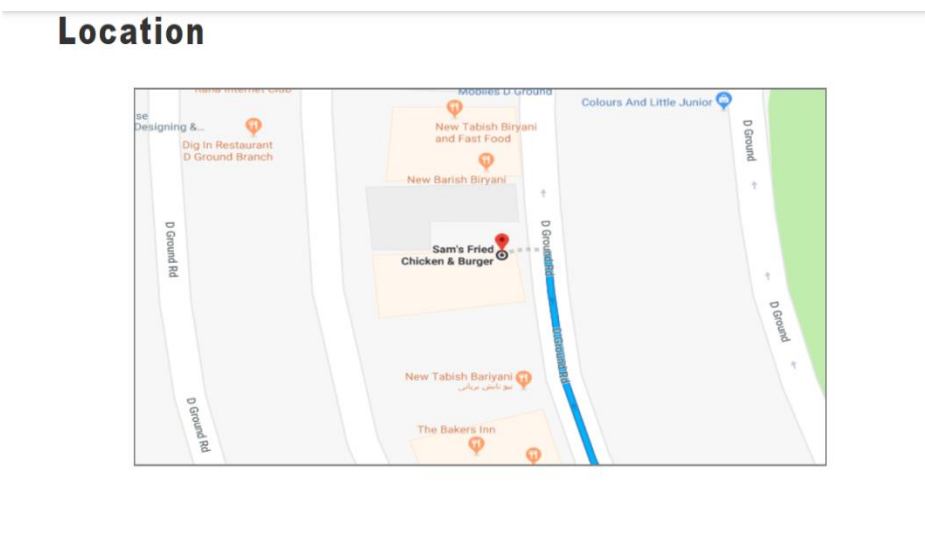
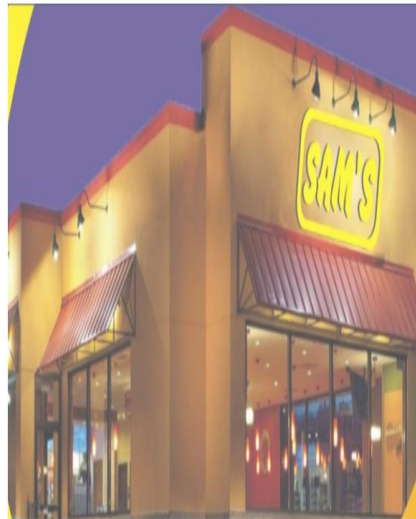


Fig5.1.4

## About us Page:

This page displays the information about the restaurant its history. This section consists of introduction of the restaurant.



### SAM'S FOOD RESTAURANT

32 Years Of Success And Counting...

SAM'S Fried Chicken & Burgers first opened its doors back in 1986. A lot has changed Since then, but our commitment to serving freshly prepared all of our food at a great value has been our core mission from the beginning.

SAM'S was opened in D-Ground, Faisalabad. From the very first start, we set out provide quality food specially Fried Chicken and Burgers at reasonable price. A concept that was revolutionary at the time. SAM'S abbreviates for SHEIKH ABDUL MAJEED & SONS. SAM'S food was very new concept in the history of Faisalabad and a great hit, by 2010 we had opened 3 location. We now rolled out a new 21st century restaurant image design to enhance the SAM'S experience or our guests. We've worked to create a ambiance and welcoming atmosphere that transports you to your favorite and unique family fun destination as soon as you walk through our doors. Through these changes, SAM'S has never wavered from its core commitment Great food, great prices, and even better service. We're proud of our heritage, The years we've invested in perfecting our menu, and the hospitality we offer every guest at each of our restaurants and we're confident You'll enjoy your SAM'S Experience.

Fig5.1.5

## Customer Registration Page:

This page is used to get customer information and save that to database for later use and sending offers to the customers.

A screenshot of a "Customer Registration" form overlaid on the same restaurant exterior image as in Fig5.1.5. The form is a semi-transparent white box with a dark border. It contains the following fields: "Name" with a text input field, "Password" with a text input field, "Confirm Password" with a text input field labeled "Re-Enter Password...", "Email" with a text input field, "Phone No" with a text input field labeled "Phone Number...", and "Gender" with radio buttons for "Male" and "Female". At the bottom of the form are two buttons: "Submit" (blue) and "Cancel" (orange). A small pencil icon is visible in the top right corner of the form box.

Fig5.1.6

## Log In Page:

This webpage consist of form which takes email and password of registered user.

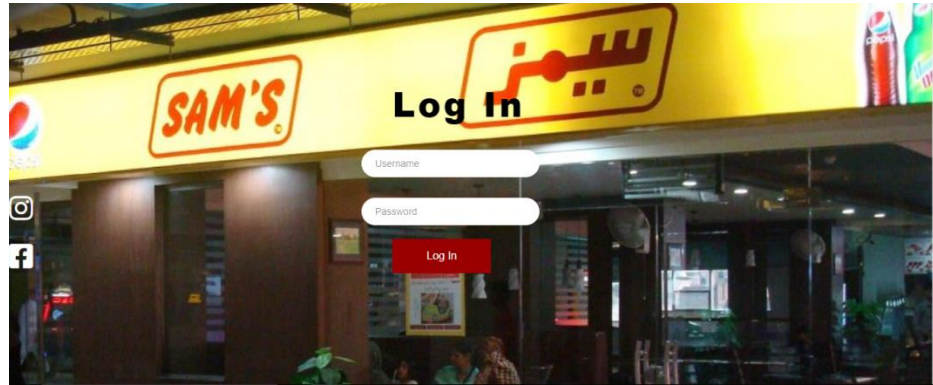


Fig5.1.7

### 5.1 System Architecture:

System architecture is the structural design of systems. Systems are a class of software that provides foundational services and automation. A basic approach to architecture is to separate work into components. These may be designed to be reusable.

The Website consists of landing page, about page, SAM'S menu page, header, footer, and slider. My SQL database will be used for management of user data. There will be a complete website for Sam's restaurant.

Our Sam's website consists of following modules called webpages:

*Fig5.1.1*

## **5.2 Operational Model:**

Yes

No



*Fig5.2.1*

## **Chapter 6**

### **System Testing and Evaluation**

#### **6.1 Usability Testing:**

Usability testing, a non-functional testing technique (Andreasen, Nielsen, & Schrøder, 2007) that is a measure of how easily the system can be used by end users. It is difficult to evaluate and measure but can be evaluated based on the below parameters:

- ❖ Levels of Skill required learn/use the software. It should maintain the balance for both novice and expert user.
- ❖ Time required to get used to in using the software.
- ❖ The measure of increase in user productivity if any.
- ❖ Assessment of a user's attitude towards using the software.

#### **6.2 Software performance testing:**

Software performance testing is the practice of determining whether a given application has the capacity to perform in terms of scalability and responsiveness under a specified workload. Responsiveness refers to the ability of a given application to meet pre-determined objectives for

throughput, while scalability is the number of activities processed within a given time. Performing this type of testing is a key factor when ascertaining the quality of a given application.

### 6.3 Cross Browser Testing:

Some Site Professional (James A. Whittaker, 2006) checks websites for features that don't work correctly, or behave differently, on different browsers:

- ❖ **Internet Explorer compatibility** back to version 6.0.
- ❖ **Desktop browser compatibility** in Chrome, Firefox, Safari, Opera and Edge.
- ❖ **Mobile browser compatibility** in iPhone/iPad, Android and Blackberry.
- ❖ HTML tags not supported by some browsers.
- ❖ CSS features not supported by some browsers.
- ❖ Vendor specific HTML and JavaScript.
- ❖ Image formats not supported by all browsers (e.g. some transparent PNGs don't display correctly on old versions of Internet Explorer)

### 6.4 Unit Testing:

Test smallest testable parts of an application, called units, are individually and independently scrutinized for proper operation.

Participants/ Tested by: Developers

Methodology: Used for the Database test, records in each table, Basic function test.

### 6.5 User Acceptance Testing:

Formal testing with respect to user needs, requirements, and business processes conducted to determine whether or not a system satisfies **Participants/ Tested by:** Users / End Users

**Methodology:** It is used for Whole System Test.

**Table 6.1.1: Test Case – Customer registration**

Test Item	Customer Registration
Actors	User, Software Developer

Description	Data Validation Check and Submission.
Pre – Conditions	Properly installed browsers with updated versions. Database Connection.
Post- Conditions	The Data should be submitted in database.
Notes and Issues	No
<b>Environmental Needs</b>	Internet Browser
Hardware	PC, Laptop, Android Phone
Software	Operating System, Internet Browsers
<b>Set Up, Tear Down and other Procedures</b>	
<b>Inter case Dependencies</b>	Installation

**Table 6.1.2: Test Case – Log In:**

Test Item	Log In
Actors	User, Software Developer
Description	Data Validation Check and Verification

Pre - Conditions	Properly installed browsers with updated versions. Database Connection .Registered user in database
Post- Conditions	The user should be logged in and directed to feedback page.
Notes and Issues	No
Environmental Needs	Internet Browser
Hardware	PC, Laptop, Android Phone
Software	Operating System, Internet Browsers
<b>Set Up, Tear Down and other Procedures</b>	
<b>Inter case Dependencies</b>	Installation

**Table 6.1.3: Test Case – Website performance check:**

<b>Test Item</b>	<b>Website Performance Check</b>
Actors	User, Software Developer
Description	The website will be checked under heavy traffic and load.
Pre – Conditions	Properly installed browsers with updated versions. Multiple devices and users.
Post- Conditions	The website should work smoothly.

Notes and Issues	No
<b>Environmental Needs</b>	Internet Browser, Different users with different operating systems
Hardware	PC, Laptop, Android Phone
Software	Operating System, Internet Browsers
<b>Set Up Tear Down and other Procedures</b>	
<b>Inter case Dependencies</b>	Installation

**Table 6.1.4: Test Case – webpages Responsive Test:**

<b>Test Item</b>	<b>Webpages Responsiveness Test</b>
Actors	Software Developer
Description	Test the webpages in different browsers and devices whether it is cross- platform free from error.
Pre – Conditions	Properly installed browsers with updated versions.
Post- Conditions	The Webpages should work with all devices and adjust according to device width.
Notes and Issues	No
<b>Environmental Needs</b>	Different Browsers with different versions. Testing on multiple devices.

Hardware	PC, Laptop, Android Phone
Software	Operating System, Internet Browsers
<b>Set Up, Tear Down and other Procedures</b>	
<b>Inter case Dependencies</b>	Installation

References:

## References

2008), S. M. (2013). Chapter 1: Building a Simple Network. In *Network World*.

Andreasen, M. S., Nielsen, H. V., & Schrøder, S. O. (2007). *What happened to remote usability testing?*

Clements, P., Bachmann, F., Bass, L., Garlan, D., Ivers, J., Little, R., . . . Nord, R. (2010). *Documenting Software Architectures: Views and Beyond, Second Edition*. Boston: Addison-Wesley. ISBN 978-0-321-55268-6.

Codd, E. (1990). Chapter 23, "Serious Flaws in SQL. In *The Relational Model for Database Management: Version 2*. Addison-Wesley.

James A. Whittaker. (2006). *How to Break Web Software: Functional and Security Testing of Web Applications and Web Services*.

M.A. Kahn, D. R. (1977,). MICRO Information Management System. Institute of Labor and Industrial Relations (ILIR), University of Michigan and Wayne State University.

MachineDefense Acquisition University Press. (2006). *Systems Engineering Fundamentals*.

Ralph, P. a. (2009). A proposal for a formal definition of the design concept.

Swiderski, M. A. (2013). *Work Breakdown Structures*. Retrieved from [workbreakdownstructure.com](http://workbreakdownstructure.com)



